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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,898	10/21/2005	Shusaku Takagi	05702/HG	9904

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EXAMINER	
KIECHLE, CAITLIN ANNE	

ART UNIT	PAPER NUMBER
1733	

MAIL DATE	DELIVERY MODE
04/04/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/553,898	TAKAGI ET AL.	
	Examiner	Art Unit	
	CAITLIN FOGARTY	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 14, 2011 has been entered.

Status of Claims

2. Claims 1 – 8 are pending where claims 1 and 5 have been amended.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1 – 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0047256 (hereinafter US '256).

With respect to instant claim 1, [0001] and [0045]-[0049] of US '256 disclose a high tensile cold rolled steel sheet with an either overlapping or close composition as seen in Table 1 below.

Table 1

Element	Claims 1 & 5	US '256	Overlapping Range

	(mass %)	(mass %)	(mass %)
C	0.04 – 0.13	≤ 0.15	0.04 – 0.13
Si	0.3 – 1.2	0.05 – 1.5	0.3 – 1.2
Mn	1.0 – 3.5	≤ 3.0	1.0 – 3.0
P	≤ 0.04	0.03 – 0.15	0.03 – 0.04
S	≤ 0.01	≤ 0.02	≤ 0.01
Al	0.021 – 0.07	≤ 0.02	Close
N	≤ 0.004	0.0050 – 0.0250	Close
Cr	≤ 0.2	0.05 – 1.0	0.05 – 0.2
Fe + Impurities	Balance	Balance	Balance

Although the compositional ranges of Al and N in the steel of US '256 do not overlap with the instant claimed ranges of Al and N, they are very close in value because 0.02% Al is very close to 0.021% Al and 0.0050% N is very close to 0.004% N and therefore one of ordinary skill in the art would have expected them to have the same properties. Thus, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. See MPEP 2144.05 I. The steel sheet of US '256 satisfies the claim limitation "consisting essentially of" because it does not require any additional elements that are not recited in the instant claims. US '256 also teaches in [0045], [0108], and [0109] that the steel sheet has a microstructure of a ferritic phase with an area ratio of 50% or more and a martensitic phase at an area ratio of 3% or more which overlaps with the instant claimed ranges of ferrite and martensite.

US '256 differs from instant claim 1 because it does not specifically teach the ratio of intervals of the martensite in the rolling direction to those in the sheet thickness direction or the nano strength of the martensite. However, since the cold rolled sheet of US '256 has an overlapping or close composition with the composition recited in instant claim 1 and the steel sheet of US '256 is made using essentially the same process as

the instant invention as discussed below for instant claim 5, one of ordinary skill in the art would have expected the steel sheet of US '256 to inherently have a similar ratio and nano strength of martensite. See MPEP 2112 IV and V.

In regards to instant claim 2, [0045]-[0049] of US '256 teach that the steel sheet may further comprise 0.05-1.0% Mo, 0.05-1.5% Ni, or 0.0003-0.01% B which overlap with the compositional ranges of Mo, Ni, and B recited in the instant claim.

Regarding instant claims 3 and 4, [0045]-[0049] of US '256 disclose that the steel sheet may additionally comprise 0.01-0.2% Ti or 0.01-0.1% Nb which both overlap with the compositional ranges of Ti and Nb recited in the instant claims.

With respect to instant claim 5, [0045]-[0055], [0141], [0142], [0146], [0145], [0147]-[0149], and [0158]-[0161] of US '256 teach a method for manufacturing a high tensile cold rolled steel sheet. The method includes hot rolling a steel slab with an overlapping or close composition with the steel recited in instant claim 5, as discussed above for instant claim 1, into a steel sheet. Although the compositional ranges of Al and N in the steel of US '256 do not overlap with the instant claimed ranges of Al and N, they are very close in value because 0.02% Al is very close to 0.021% Al and 0.0050% N is very close to 0.004% N and therefore one of ordinary skill in the art would have expected them to have the same properties. Thus, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. See MPEP 2144.05 I. Then, the sheet is coiled at a coiling temperature of 750℃ or below which overlaps with the claimed coiling temperature. Next, cold rolling

is performed on the coiled steel sheet at a cold rolling reduction of 40% or more which overlaps with the instant claimed range. Then, the cold rolled sheet is annealed at a temperature between 700℃ and 900℃. Finally, the annealed sheet is cooled to 300-600℃ at a cooling rate of 5℃/s or above which overlaps with the claimed cooling temperature and cooling rate. US '256 also teaches in [0045], [0108], and [0109] that the steel sheet has a microstructure of a ferritic phase with an area ratio of 50% or more and a martensitic phase at an area ratio of 3% or more which overlaps with the instant claimed ranges of ferrite and martensite. The steel sheet of US '256 satisfies the claim limitation "consisting essentially of" because it does not require any additional elements that are not recited in the instant claims.

US '256 differs from instant claim 5 because it does not teach the formula of the annealing temperature range recited in claim 5. However, the annealing temperature range of 700℃-900℃ disclosed by US '256 overlaps with the specific examples of annealing temperature ranges recited in Table 2-2 of the instant application. Therefore, in the absence of factual evidence demonstrating the criticality of the annealing temperature formula, US '256 teaches annealing temperatures that satisfy the formula recited in claim 5. US '256 also differs from instant claim 5 because it does not specifically teach the ratio of intervals of the martensite in the rolling direction to those in the sheet thickness direction or the nano strength of the martensite. However, since the cold rolled sheet of US '256 has an overlapping or close composition with the composition recited in instant claim 5 and the steel sheet of US '256 is made using essentially the same process as the instant invention as discussed below for instant

claim 5, one of ordinary skill in the art would have expected the steel sheet of US '256 to inherently have a similar ratio and nano strength of martensite. See MPEP 2112 IV and V.

In regards to instant claim 6, [0045]-[0049] of US '256 teach that the steel sheet may further comprise 0.05-1.0% Mo, 0.05-1.5% Ni, or 0.0003-0.01% B which overlap with the compositional ranges of Mo, Ni, and B recited in the instant claim.

Regarding instant claims 7 and 8, [0045]-[0049] of US '256 disclose that the steel sheet may additionally comprise 0.01-0.2% Ti or 0.01-0.1% Nb which both overlap with the compositional ranges of Ti and Nb recited in the instant claims.

Since the claimed temperature and compositional ranges of claims 1 – 8 either overlap, are close, or are within the ranges disclosed by US '256, a prima facie case of obviousness exists. See MPEP 2144.05. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed temperature ranges and steel sheet composition from the temperature ranges and steel sheet composition disclosed by US '256 because US '256 teaches the same utility (i.e. lightweight structural materials) in the whole disclosed range.

6. Claims 1 – 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,319,338 (hereinafter US '338).

With respect to instant claim 1, col. 1 lines 7-13, col. 2 line 15-col. 3 line 25, and col. 11 lines 41-46 of US '338 disclose a high tensile cold rolled steel sheet with an overlapping composition as seen in Table below.

Table 2

Element	Claims 1 & 5	US '338	Overlapping Range

	(mass %)	(mass %)	(mass %)
C	0.04 – 0.13	0.03 – 0.3	0.04 – 0.13
Si	0.3 – 1.2	0.5 – 3.0 Si &/or Al	0.5 – 1.27 Si &/or Al
Mn	1.0 – 3.5	0.5 – 3.5	0.5 – 3.5
P	≤ 0.04	≤ 0.3	≤ 0.3
S	≤ 0.01	≤ 0.01	≤ 0.01
Al	0.021 – 0.07	0.5 – 3.0 Si &/or Al	0.5 – 1.27 Si &/or Al
N	≤ 0.004	----	0
Cr	≤ 0.2	Optional	0
Fe + Impurities	Balance	Balance	Balance

US '338 does not teach a separate compositional range of Al. However, as seen in Table 5 of US '338 there are several specific examples of the steel with an Al composition of 0.04, 0.05, and 0.03 mass% which are all within the claimed Al range. In addition, US '338 does not teach a separate compositional range of N. However, the steel of US '338 contains an impurity level of N as evidenced by Table 5 of US '338 which has several specific examples of the steel with an N composition of 0.003 and 0.002 mass% N which are all within the instant claimed N range. The steel sheet of US '338 satisfies the claim limitation "consisting essentially of" because it does not require any additional elements that are not recited in the instant claims. US '338 also teaches in col. 2 line 15-col. 3 line 25 that the steel sheet has a microstructure of a ferritic phase with a volume fraction of 40% or more and a martensitic phase at a volume fraction of 3-30% which both overlap with the instant claimed ranges of ferrite and martensite.

US '338 differs from instant claim 1 because it does not specifically teach the ratio of intervals of the martensite in the rolling direction to those in the sheet thickness direction or the nano strength of the martensite. However, since the cold rolled sheet of US '338 has an overlapping composition with the composition recited in instant claim 1 and the steel sheet of US '338 is made using essentially the same process as the

instant invention as discussed below for instant claim 5, one of ordinary skill in the art would have expected the steel sheet of US '338 to inherently have a similar ratio and nano strength of martensite. See MPEP 2112 IV and V.

In regards to instant claim 2, col. 2 line 15-col. 3 line 25 of US '338 teach that the steel sheet may further comprise one or more from among Mn, **Ni**, Cr, and **Mo** at a total of from 0.5-3.5%, 0.05-1.5% Ni or no greater than 0.01% B which overlap with the compositional ranges of Mo, Ni, and B recited in the instant claim. Ni is not a required element in the steel of US '338 and Table 5 Alloy 23 teaches a specific example of a steel with a Mo composition of 0.2% which is within the instant claimed range and would serve as a guide to one of ordinary skill in the art when selecting a composition of Mo.

Regarding instant claims 3 and 4, col. 2 line 15-col. 3 line 25 of US '338 disclose that the steel sheet may additionally comprise one or more from among **Nb**, **Ti**, and V at a total of no greater than 0.3% which both overlap with the compositional ranges of Ti and Nb recited in the instant claims.

With respect to instant claim 5, col. 1 lines 7-13, col. 2 line 15-col. 3 line 25, col. 11 lines 41-46, and col. 11 line 60-col. 16 line 35 of US '338 teach a method for manufacturing a high tensile cold rolled steel sheet. The method includes hot rolling a steel slab with an overlapping composition with the steel recited in instant claim 5, as discussed above for instant claim 1, into a steel sheet. US '338 does not teach a separate compositional range of Al. However, as seen in Table 5 of US '338 there are several specific examples of the steel with an Al composition of 0.04, 0.05, and 0.03 mass% which are all within the claimed Al range. In addition, US '338 does not teach a

separate compositional range of N. However, the steel of US '338 contains an impurity level of N as evidenced by Table 5 of US '338 which has several specific examples of the steel with an N composition of 0.003 and 0.002 mass% N which are all within the instant claimed N range. Then, the sheet is coiled at a coiling temperature of 500℃ or below which overlaps with the claimed coiling temperature. Next, cold rolling is performed on the coiled steel sheet at a cold rolling reduction of 40% or more which overlaps with the instant claimed range. Then, the cold rolled sheet is annealed at a temperature of from $0.1x(Ac_3-Ac_1)+Ac_1$℃ to Ac_3+50℃. Finally, the annealed sheet is cooled to 150-450℃ by two cooling steps where the last cooling step is at a cooling rate at least 10℃/s which overlaps with the claimed cooling temperature and cooling rate. US '338 also teaches in col. 2 line 15-col. 3 line 25 that the steel sheet has a microstructure of a ferritic phase with a volume fraction of 40% or more and a martensitic phase at a volume fraction of 3-30% which both overlap with the instant claimed ranges of ferrite and martensite. The steel sheet of US '338 satisfies the claim limitation "consisting essentially of" because it does not require any additional elements that are not recited in the instant claims.

US '338 differs from instant claim 5 because it does not teach the formula of the annealing temperature range recited in claim 5. However, the annealing temperature range of $0.1x(Ac_3-Ac_1)+Ac_1$℃ to Ac_3+50℃ and the specific example annealing temperatures in Table 6 disclosed by US '338 are within the specific examples of annealing temperature ranges recited in Table 2-2 of the instant application. Therefore, in the absence of factual evidence demonstrating the criticality of the annealing

temperature formula, US '338 teaches annealing temperatures that satisfy the formula recited in claim 5. US '338 also differs from instant claim 5 because it does not specifically teach the ratio of intervals of the martensite in the rolling direction to those in the sheet thickness direction or the nano strength of the martensite. However, since the cold rolled sheet of US '338 has an overlapping composition with the composition recited in instant claim 5 and the steel sheet of US '338 is made using essentially the same process as the instant invention as discussed below for instant claim 5, one of ordinary skill in the art would have expected the steel sheet of US '338 to inherently have a similar ratio and nano strength of martensite. See MPEP 2112 IV and V.

In regards to instant claim 6, col. 2 line 15-col. 3 line 25 of US '338 teach that the steel sheet may further comprise one or more from among Mn, **Ni**, Cr, and **Mo** at a total of from 0.5-3.5%, 0.05-1.5% Ni or no greater than 0.01% B which overlap with the compositional ranges of Mo, Ni, and B recited in the instant claim. Ni is not a required element in the steel of US '338 and Table 5 Alloy 23 teaches a specific example of a steel with a Mo composition of 0.2% which is within the instant claimed range and would serve as a guide to one of ordinary skill in the art when selecting a composition of Mo.

Regarding instant claims 7 and 8, col. 2 line 15-col. 3 line 25 of US '338 disclose that the steel sheet may additionally comprise one or more from among **Nb**, **Ti**, and V at a total of no greater than 0.3% which both overlap with the compositional ranges of Ti and Nb recited in the instant claims.

Since the claimed temperature and compositional ranges of claims 1 – 8 either overlap or are within the ranges disclosed by US '338, a prima facie case of

obviousness exists. See MPEP 2144.05. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed temperature ranges and steel sheet composition from the temperature ranges and steel sheet composition disclosed by US '338 because US '338 teaches the same utility (i.e. structural automotive members) in the whole disclosed range.

Response to Arguments

7. Applicant's arguments filed March 2, 2011 have been fully considered but they are not persuasive.

Arguments are summarized as follows:

a. In the Table attached to applicant's response filed October 18, 2010, evidence was provided that showed that of all the 49 examples of US '256, there are only 10 examples wherein the range of the annealing temperature is within the range of the presently claimed invention. Moreover, there are absolutely no steel sheets out of such 10 examples which contain martensite in an amount of at least 10% in terms of area ratio. The December 27, 2010 Office Action did not provide any reasons why applicants' aforesaid evidence was not sufficient to overcome the obviousness rejection.

b. US '256 and the presently claimed invention are owned by the same assignee. Applicants are thus well aware of US '256 and submit that the presently claimed invention substantially differs from US '256. The steel sheet of US '256 is a so-called "high-nitrogen steel." Such steel sheet can be imparted with a desirable BH (bake hardening) by increasing the amount of N therein.

Strain age hardening is obtained by N, in lieu of C. Therefore, the N content of US '256 is as much as 0.0050-0.0250%, and at the same time, the Al content is restricted to 0.02% or less for the purpose of preventing the consumption of N as AlN. In contrast to US '256, the inclusion of N is not necessary in the steel sheet according to the presently claimed invention, whereas up to 0.07% Al is contained to obtain its deoxidation effect.

Examiner's responses are as follows:

a. A set forth in the December 27, 2010 Office Action, the Examiner stated that the evidence cited by Applicant is not sufficient to overcome the obviousness rejection because the scope of the prior art of US '256 is not limited to the specific embodiments it teaches. See MPEP 2123. Rather, the Examiner relied on the broadest teaching of US '256 which discloses an annealing temperature that overlaps with the specific examples of annealing temperature ranges recited in Table 2-2 of the instant application and an overlapping area ratio of martensitic phase and thus a prima facie case of obviousness exists.

b. As discussed in the above rejection, although the compositional ranges of Al and N in the steel of US '256 do not overlap with the instant claimed ranges of Al and N, they are very close in value because 0.02% Al is very close to 0.021% Al and 0.0050% N is very close to 0.004% N and therefore one of ordinary skill in the art would have expected them to have the same properties. Thus, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have

expected them to have the same properties. See MPEP 2144.05 I. Applicant has not demonstrated that a steel sheet with 0.02% Al and 0.0050% N compared to a steel sheet with 0.021% Al and 0.004% N would have completely different properties.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAITLIN FOGARTY whose telephone number is (571)270-3589. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/

Supervisory Patent Examiner, Art Unit 1733

CF